10.0 FEDERAL CONVENTIONS FOR USING ASC X12 TRANSACTION SETS

This chapter defines the Federal transaction set conventions. It includes the instructions for implementing the control structure and definitions of the usage indicators and applicable codes.

10.1 INTRODUCTION

The power of the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 standard is in its building block concept, which standardizes the essential elements of business transactions. The concept is analogous to a "standard bill of materiel and the construction specifications," which gives the architect flexibility in what can be designed with standardized materiel and procedures. The Electronic Data Interchange (EDI) system designer, like the architect, uses the ASC X12 standards to build business transactions that are often different because of their function and yet utilize the ASC X12 standards. The "bill of materiel and the construction specification" of ASC X12 are the standards found in the published technical documentation.

ASC X12.3, December, 1996 —The *Data Element Dictionary* specifies the data elements used in the construction of the segments that comprise the transaction sets developed by ASC X12.

ASC X12.5, December, 1996 —The *Interchange Control Structure* provides the interchange control segment (also called an envelope), consisting of a header and trailer, for the EDI transmission; it also provides a structure to acknowledge the receipt and processing of the envelope.

ASC X12.6, December, 1996 —The *Application Control Structure* defines the basic control structures, syntax rules, and semantics of EDI.

ASC X12.22, December, 1996 —The *Data Segment Directory* provides the definitions and specifications of the segments used in the construction of transaction sets developed by ASC X12.

ASC X12.58, December, 1996 -- The *Security Structures* define the data formats for authentication, encryption, and assurances in order to provide integrity, confidentiality, verification and non-repudiation of origin for two levels of exchange of Electronic Data Interchange (EDI) formatted data: functional group and transaction set level.

X12.59, December, 1996 --The *Implementation of EDI Structure/Semantic Impact* provides a clear distinction between the syntax of X12 structures and the semantics of transaction set usage.

X12C/TG1/95-65 -- *Technical Report Reference Model for the Acknowledgment and Tracking of EDI Interchanges* summarizes the use of the ANSI ASC X12 control elements and standards for the acknowledgment and tracking of EDI interchanges.

International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) Recommendation X.509 *(1993)/ ISO/IEC 9594-8 (1995), Information Technology- Open Systems Interconnection- The Directory : Authentication Framework. The Directory*, defines a framework for the provision of authentication services by the Directory to its users. It specifies the form of authentication information held by the Directory, describes how authentication information may be obtained from the Directory, states the assumptions made about how authentication information is formed and placed in the Directory, defines three ways in which applications may use authentication information to perform authentication, and describes how other security services may be supported by authentication.

In addition to using existing standards to build specific transactions, the standards may be used to provide control and tracking of interchanges if accomplished in a specific standardized approach. ANSI ASC X12 has defined and approved several control structures and Transaction Sets intended to augment EDI auditing and control systems. It is the intent of these standards to provide a tracking mechanism for EDI data as it moves through the transmission cycle. Through the implementation of these tracking tools and analysis of the resulting information, delay or failures in delivery can be identified and corrected.

The work accomplished by ANSI ASC X12C in this area produced a generic acknowledgment model that has been adapted to support Federal Government EDI processes. Implementation of the acknowledgment mechanisms identified by this model will provide a basic capability to track interchanges as they flow from senders through Service Request Handlers (SRH) to receivers across the EC/EDI Infrastructure. (An SRH is a service provider whose primary function is to provide communications services between other components in the model.) This basic capability will provide functionality for each component to determine translation and transmission status, including current location and disposition of an interchange. Use of the implemented acknowledgment mechanisms to determine singular event status can provide components with the information necessary to obtain some level of confidence that interchanges are flowing through the infrastructure properly.

Taken as a sequence of acknowledgment events, the model provides senders with a means to track interchanges from generation to delivery to a Service Request Handler at the boundary of the infrastructure, without imposing the processing and communications overhead that would be required for true application to application acknowledgments.

In addition, the implemented acknowledgment mechanisms of this model will allow individual components to build upon or enhance their internal audit trail processes.

This Part 10 of the implementation guidelines is meant to be an overarching architecture of the control structure which the government is implementing in the Electronic Commerce Infrastructure (ECI). However, not all the parts of the architecture will be implemented immediately. The specifics of which parts are actually implemented will be defined in agreements between the ECI and other components in the trading network and architecture, such as Value Added Networks (VANs) and government users of the ECI.

It is not the intent of this guideline to specify how the implemented acknowledgment mechanisms are to be used. While support of these mechanisms is required, their usage between infrastructure components will be as agreed between those components. As an example, the use of certain acknowledgment mechanisms between the government and VANs is specified in a VAN Licensing Agreement (VLA). Where there is a conflict between the implementation guidance provided in Part 10 and the VLA, the VLA shall take precedence. Also, the use of acknowledgments between Government Points of Translation (GPoT) and other infrastructure components can be as mutually agreed upon.

The Service Level Agreement (SLA) between the ECI and the respective government Automated Information Systems (AIS) acts in a similar manner as the VLA. Where there is a conflict between the implementation guidance provided in Part 10 and the SLA, the SLA shall take precedence.

By focusing on basic acknowledgment functionality that is independent of communications protocols, enhanced tracking of interchanges is accomplished without requiring individual components to adhere to or support a full accountability system.

For further clarification of acronyms, abbreviations, and codes, refer to ASC X12 published technical documentation. For copies, contact either the EDI focal point within your service or agency, or, alternatively, contact the administering body (see Section 1.3 of these guidelines).

10.2 CONTROL SEGMENTS

In addition to communications control, the EDI interchange structure provides the standards user with multiple levels of control to ensure data integrity. It does so by using header and trailer control segments designed to identify uniquely the start and end of the interchange functional groups and transaction sets. The relationship of these control segments is shown in Figure 10.2-1. Control Segment specifications are defined in Section 10.6.

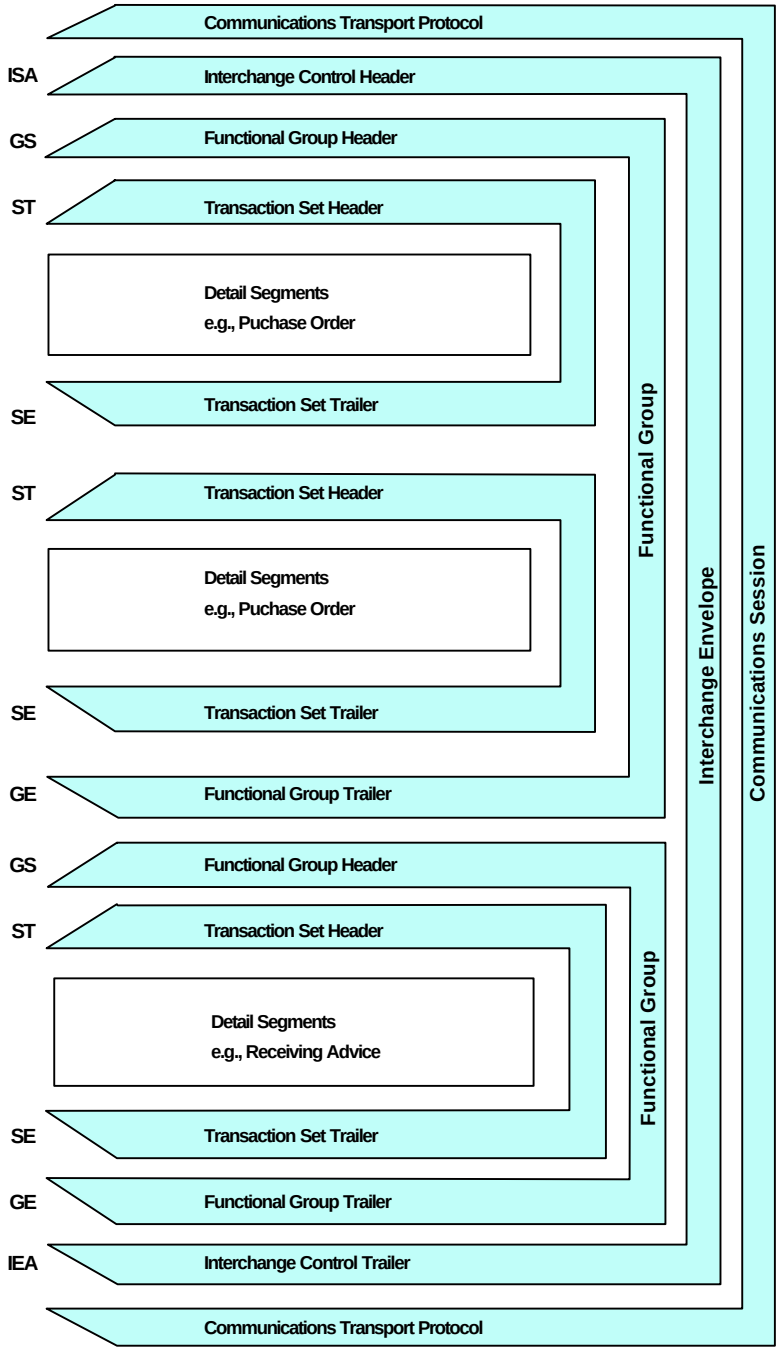
10.2.1 Description of Use

The interchange header and trailer segments (ISA/IEA) along with the optional interchange acknowledgment segments (TA1 and TA3) constitute the interchange control structure (i.e., an interchange envelope). Interchange control segments perform the following functions:

- Define data element separators, subelement separators and data segment terminators
- Provide control information
- Identify interchange sender and receiver
- Allow for authorization and security information.

The actual interchange control structure includes neither the group control structures nor the transaction control structures; these are defined by ASC X12 as application control structures, and their version and release may differ from those for the interchange envelope. An interchange envelope encompasses one or more functional groups (GS/GE), which, in turn, enclose one or more related transaction sets (ST/SE). The relationship for these structures is illustrated in Figure 10.2-1.

The purpose for GS/GE functional grouping is to provide an additional control envelope surrounding like transaction sets conforming with a unique Implementation Convention (IC). Their usage is prescribed as interchange control segments in order to present a consistent methodology for electronic data interchange within the government community and for commercial entities that conduct EDI business with the government.



Note:

1. When an Interchange contains TA3s, it shall contain only TA3s. The TA3s, replace all Functional Groups, Security Envelopes, Transaction Headers and Trailers, as well as Detail Segments in the above diagram.

2. See Sections 10.5.2, 10.5.3 and 10.6. for the application of Assurance (Digital Signature) and Confidentiality (Encryption) segments.

Figure 10.2-1. Hierarchical Structure

10.2.1.1 Data Element, Data Segment, and Component Data Element Separation

In ASC X12 documentation, the data element separator is graphically displayed as an asterisk (*). The actual data element separator employed within the interchange envelope assigns the value for the entire interchange. The first occurrence of the data element separator is at the fourth byte of the interchange control header. The value appearing there prescribes the data element separator used through the next interchange trailer.

***Implementation Note**: The data element separator must be (1) disjoint from every other data element within an interchange and (2) must not conflict with telecommunications protocols necessary to the transmission of the interchange. ASCII hexadecimal character 1D shall be used in Federal Government interchanges.*

In a similar manner, the interchange control header establishes the value to be used for segment termination within an interchange. ASC X12 documentation represents this graphically by a new line (N/L). The first instance of segment termination occurs immediately following the ISA16 data element, and the data value occurring there sets the value for the interchange.

***Implementation Note:** The segment terminator value must be disjoint from every other data value within an interchange and not in conflict with transmission protocols. ASCII hexadecimal character 1C shall be used in Federal Government interchanges.*

Designation of a component data element separator differs from the other separators in that the ISA segment provides a discrete element (ISA16) for defining the component data element separator data value.

***Implementation Note**: The component data element separator must be different than any other data elements in the interchange and not conflict with transmission or device control protocols. ASCII hexadecimal character 1F shall be used in Federal Government interchanges.*

10.2.1.2 Identification of Implementation Convention

The Federal Government develops and maintains Implementation Conventions (ICs) based on ASC X12 standards. All entities conducting EDI business within the Government or externally with the Government shall comply with all applicable ICs. ICs are available from National Institute of Standards and Technology acting as the secretariat for the Federal EDI Standards Management Coordinating Committee (FESMCC). Conventions on the use of interchange control structures are provided herein to document a consistent approach to control structure content. The functional group control structures

include the ability to identify specific ICs to which the Transaction Sets contained within that group conform. Interchange senders will provide the ASC X12 Version/ Release/Subrelease and implementation convention identifier in GS08. This identifier uniquely identifies the the convention to which the transaction set conforms.

Implementation Note: *Envelope control segments have few options and, except for minor tailoring, are identical for every EDI interchange. The tailoring involves the code values selected for the GS01 and GS08 elements. GS01 classifies the particular transaction set(s) within a functional group and GS08 identifies the specific IC with which the transactions contained within the group comply. (Note: The version and release identified in ISA12 pertains to the interchange control envelope, not to the contained transaction sets.)*

The Version/Release/Industry Identifier Code (GS08) is structured as follows:

Positions 1 through 6:	ANSI ASC X12 Version and Release number (e.g. 003010) upon which the IC is based.
Position 7	Organizational Scope (e.g. F = Federal, D = DOD, etc.)
Positions 8 through 10	Transaction Set Identifier Code (e.g. 850).
Position 11:	Derivative: A character indicating a functional derivative of a convention (e.g., P = Progress Payment, C = Confirmation). If the convention is not a derivative, an underscore (_) will appear in this position.
Position 12:	A sequential number starting with 0 and incremented by 1 each time the convention is re-issued.

An example of the Version/Release/ Industry Identifier Code for X12 Version 3050, Federal Specific IC, revision 1, Commercial Invoice (810C) is 003050F810C1.

10.2.1.3 Control Numbers

ASC X12 standards provide for syntax control on three levels: interchange, group, and transaction. Within each level, control numbers exhibit a positive match between the header segment

and its corresponding trailer (i.e., ISA/IEA, GS/GE, and ST/SE). Assignment of these control numbers, at each level, is as follows:

Implementation Note: *ISA/IEA Interchange Control Numbers (ISA13/IEA02).*

1. The nine-digit interchange control number is usually assigned by the originator's translation software. Originating organizations may use any numbering scheme consistent with their business practices.

2. The scheme must provide sufficient uniqueness to identify each interchange. Unique identification is defined as the triplet: Interchange Sender ID, (ISA05, ISA06), the Interchange Receiver ID, (ISA07, ISA08) and the nine-digit Interchange Control Number (ISA13). This triplet shall be unique within a reasonably extended time frame.

3. If there is no TA3, Interchange Delivery Notice, after 2 hours, then retransmit with the same interchange control number (ISA13).

4. If an interchange is rejected, the corrected interchange shall have a new interchange control number (ISA13).

Implementation Note: *GS/GE Data Interchange Control Numbers (GS06/GE02).*

1. This is a one to nine-digit number usually assigned by the originator's translation software. This number uniquely identifies functional groups transmitted between sending and receiving application pairs. Originating organizations may use any numbering scheme consistent with their business practices.

2. The scheme must provide sufficient uniqueness to identify each functional group. The Group Control Number value (GS06), together with the Application Sender's and Receiver's Codes, shall be unique within an extended time frame -- such as a year.

Implementation Note: *ST/SE Transaction Set Control Numbers (ST02/SE02). The originator's translation software usually assigns the transaction set control number. Originating organizations may use any numbering scheme consistent with their business practices. The scheme must provide sufficient uniqueness to identify each transaction set, within the context of the functional group.*

The control numbers within corresponding header and trailer segments must match. This provides a means to detect loss of data.

10.3 ADDRESSING

The purpose of addressing is to provide an unambiguous reference to a transmission's sender and intended receiver. The addressing model used by the Federal Government for ASC X12 EDI transmissions is graphically depicted in Figure 10.3-1. In this model, there is addressing for two types of transmissions. The first is an interchange. It consists of control segments and application data. The second type is application data. Application data flow from the sending to the receiving applications and is transported within an interchange. Since interchanges are assembled by the sending translation point and disassembled by the receiving translation point, the flow of an interchange is defined to be from translation point to translation point. Application data must be provided to the sending translation point by the sending application and is depicted as a User Defined File (UDF). It must also be provided to the receiving application by the receiving translation point and is also depicted as a UDF.

While the model depicts data flow from the government to a vendor, it is equally applicable in the reverse flow.

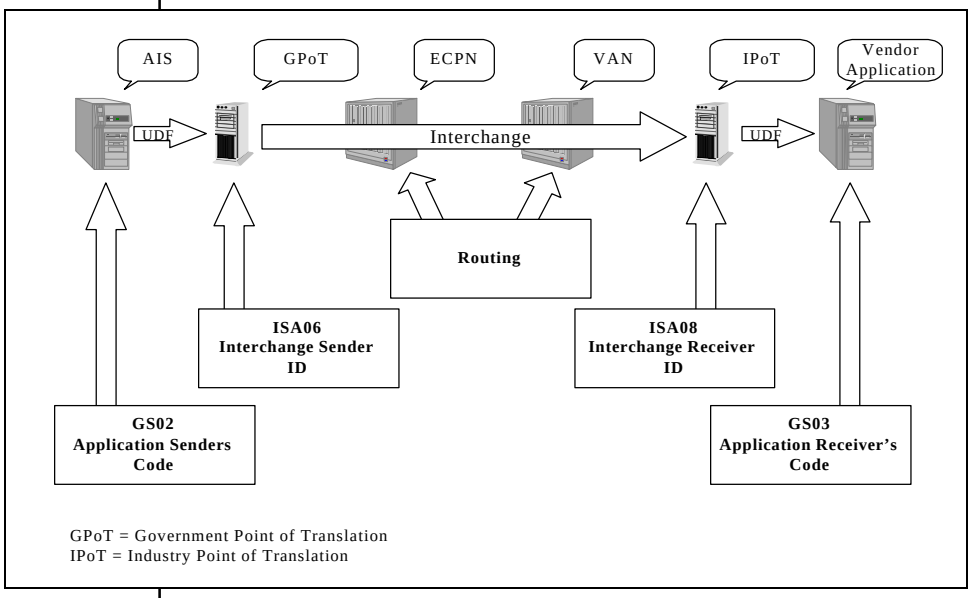


Figure 10.3-1 Addressing Model

10.3.1. Interchanges

Interchanges flow between translation locations. The Government Point of Translation (GPoT) can be implemented as part of the government Application Information System (AIS), as part of the Electronic Commerce Processing Node (ECPN), or as a stand-alone function. Likewise, the Industry Point of

Translation (IPoT) on the vendor side can be in the Vendor Application, as part of the VAN's services, or as a stand-alone function.

The GPoT and IPoT are addressed by the Interchange Sender ID (ISA06) and Interchange Receiver ID (ISA08) data elements. These, combined with the Interchange Control Number (ISA13), create a triplet that defines a globally unique identifier for the interchange. The ASC X12 Interchange flows between these translation points.

Implementation Note:

1. The Interchange Sender ID (ISA06) and Interchange Receiver ID (ISA08) data elements shall be the addresses of the interchange translation points (both government and non-government).

2. Translation Points (ISA06 and ISA08) shall be identified via a unique identifier from one of the sources listed as allowable codes in the ISA05 definition in section 10.6. The Data Universal Numbering System (D-U-N-S) number and D-U-N-S +4 are the preferred identifiers.

3. All commercial and government entities conducting business electronically shall provide their translation point (ISA06/ISA08) codes during registration.

10.3.2 Application Sender and Receiver Codes

Application data is transported within the interchange via groups. Group addressing (GS02/GS03) must define the user application end points shown in figure 10.3-1 as the AIS and the Vendor Application. These addresses are locally unique and are defined between the translation point and its customers. The data that flows between the translation points and the Application Senders and Receivers are not defined by ASC X12, but are in a format agreed between the applications and their translation points.

ASC X12 standards provide for the identification of senders and receivers on two levels, the interchange and the group. The group level identifies application senders and receivers. Depending on where translation is performed, the sender/receiver IDs may be the same at the interchange and group levels and may use any number of available naming schemes.

At the GS/GE level, D-U-N-S and D-U-N-S plus 4 are recommended, especially for identifying government organizations. Other identifiers may be used.

A D-U-N-S number may be acquired from Dun and Bradstreet and the plus 4 portion of the number is assigned and maintained

internally by each entity. Specific use of these numbers is provided for in the control structures section of this document.

Implementation Note:

1. The GS02/03 identifiers need be unique only within the context of the associated ISA address.

2. All commercial and government entities conducting business electronically shall provide their Application Sender and Receiver (GS02/GS03) codes during registration.

10.4 ACKNOWLEDGMENTS

The successful conduct of business via EDI requires that trading partners be able to determine when transactions were received, not received, received in error, or otherwise did not complete the transmission or receiver application processing cycle. The generation or handling of these events may be communications based, EDI processing based, or both. In addition, senders may desire to know such information on an exception basis, such as reporting only for error conditions, or they may need regular indication of the status of delivery to allow them to maintain local, internal audit information. Also, providers of communications services may need to know when interchanges for which they have accepted responsibility were forwarded and accepted by the next service provider in the transmission path, or whether forwarding was not successful.

In either scenario, the transmission or processing of interchanges can be viewed as an acknowledgment event in a general sense, creating the need for some response. From a sender's perspective, the acceptance of their interchange by a translator or communications provider is an acknowledgment event that could either be indicated by a simple receipt, or a more thorough reporting of what actions were taken after receipt. For a service provider, forwarding interchanges can also result in an acknowledgment event being created that calls for an acknowledgment action to take place.

Taken as a set of acknowledgment requirements, these and other events can be considered as a set of circumstances which results in or require some acknowledgment action to take place. Rather than consider every possible action and event, a basic sub-set of these events can be defined that describes the majority of cases that form a generalized picture of tracking interchanges. Together with acknowledgment mechanisms that relate to those events and specific components that create or respond to those events, an acknowledgment model can be described.

ANSI ASC X12C has worked in this area, having produced a generic Acknowledgments Model in X12C/TG1/95-65 -- *Technical Report Reference Model for the Acknowledgment and Tracking of EDI Interchanges*. This technical report identifies specific entities in the EDI communications and processing path that serve as the event generators or handlers, as well as identifying X12 standards based acknowledgment mechanisms. Also, the senders and receivers of the interchanges are recognized as being the terminating application systems for which the EDI transactions are sent from or sent to, regardless of where translation occurs. The government has taken the ANSI X12 approach to an acknowledgments model, refining it through identification of specific entities and acknowledgment events. Support for this model will provide users and service providers

with the ability to track interchanges and respond to requests for status of such interchanges. In addition, the internal audit trail processes of each entity will be enhanced with the availability of specified event mapping.

10.4.1 Description of Acknowledgment Model

As adapted from the generic model developed within ASC X12C, the Government Acknowledgment Model identifies specific components, acknowledgment events, and X12 mechanisms that are related to those events. Based upon the Electronic Commerce Processing Node (ECPN) as a central component, the model establishes a view of the EC/EDI Infrastructure as encompassing commercial and government entities, as well as service providers and users.

In this model, service providers are those components that provide translation services, communications services, or some EDI processing services. Specifically, the model identifies the ECPNs, VANs and Translation Points as service providers. A Service Request Handler (SRH) is a service provider whose primary function is to provide communications services between other components in the model. Users include Trading Partners (TPs) and Automated Information Systems (AISs).

The acknowledgment mechanisms identified in the model include unspecified as well as X12 based mechanisms. Where the model has identified an acknowledgment event but does not specify a mechanism for handling that event, it is implied that components involved in that event will agree on what mechanism will be used. As an example, the receipt of or report on the status of translation of a User Defined File (UDF) between a Government Point of Translation (GPoT) and an AIS are identified as events, but how those events are acknowledged is not described.

X12 based acknowledgment mechanisms include control segment structures in addition to transaction sets. The Interchange Delivery Notice (TA3) segment, Data Status Tracking (242) transaction set and the Functional Acknowledgment (997) transaction set all have distinct properties and functions. However, their use in a general sense as acknowledgment mechanisms allows a sequence of communications and processing events to be tied together in a logical stream. Each acknowledgment event is mapped to an X12 standards based mechanism according to where the event takes place, what type of event occurred, and what role the receiving or generating component plays in the data flow stream.

The TA3 can provide information on the status of delivery of an interchange, the time an interchange was received, or the disposition of an interchange, and is used to report such information between Service Request Handlers. The Data Status

Tracking (242) transaction set, in addition to providing the ability to represent the information contained in the TA3, allows transmission status information to be conveyed from service request handlers to senders. The Functional Acknowledgment (997) transaction set indicates the status of translation of the interchange header and trailer information. These mechanisms are more fully described later in this section.

The model, as depicted in Figures 10.4-1, 10.4-2, 10.4-3, and 10.4-4, identifies the sets of events that, through implementation and use of the specified acknowledgment mechanisms, provides for the tracking of interchanges across the infrastructure.

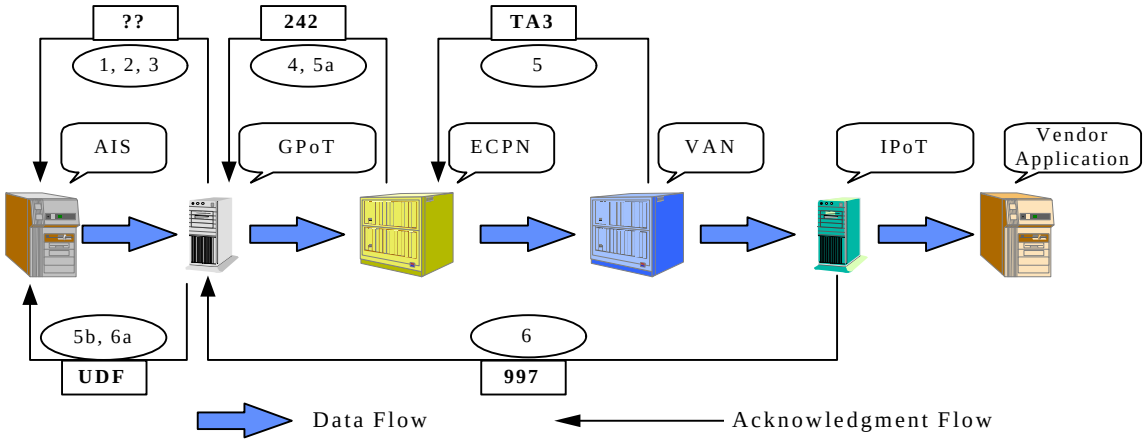
Implementation Note:

1. While the requirement for acknowledgments from Government Points of Translation (GPoT) *to supported AISs was identified, no single mechanism could be identified. It is therefore left to agreement between them as described in the Service Level Agreement.*

2. TA1 is not supported in this acknowledgment model implementation.

3. The government translation function can be implemented as part of the government Application Information System (AIS), as part of the Electronic Commerce Processing Node (ECPN), or as a stand-alone function. GPoT acknowledgment responsibilities reside at the location performing translation.

4. The vendor translation function can be implemented as part of the Vendor Application, Value Added Network (VAN) or as a stand-alone function. IPoT acknowledgment responsibilities reside at the location performing translation.



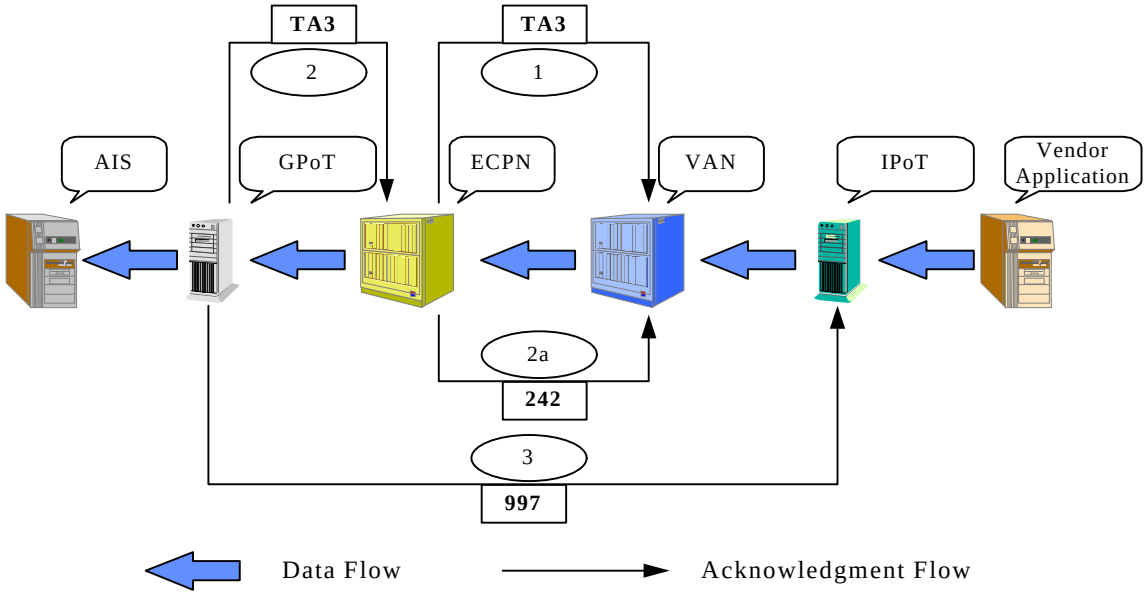
Notes:
a. The GPoT translation function may be performed by the ECPN, AIS, or by a separate entity.
b. For the purposes of the model, the govt-to-govt scenario is represented by replacing the VAN-Translation components with a GPoT component.
c. The IPoT may be operated by the VAN, the Vendor, or a third party. In all cases, the IPoT is the ultimate recipient of the interchange for the purposes of acknowledgment in this model.
d. 997s and 242s can be mapped at the GPoT to UDFs & forwarded to the AIS as agreed between the GPoT and their customer base. 242s will not be acknowledged by 997s.
e. UDF is User Defined File (flat file, proprietary file).
f. The use of 824s are not precluded by this model.
g. Support for the model acknowledgment mechanisms is mandatory. The manner of their usage is as detailed further in the Federal EDI Implementation Guidelines Part 10, or other agreements.

Figure 10.4-1 Acknowledgment Model, Commercial to Government

Sequence / Event	Mechanism	From	To
1. Receipt of UDF by GPoT	TBD	GPoT	AIS
2. Translation Result	TBD	GPoT	AIS
3. Disposition (Acknowledge that interchange has left GPoT)	TBD	GPoT	AIS
4. Interchange receipt by ECPN	242	ECPN	GPoT
5. Interchange Disposition at SRH (Government to Government)	TA3 TA3	VAN GPoT	ECPN ECPN
5a Report of Interchange Disposition at SRH	242	ECPN	GPoT
5b. Report of Interchange disposition at SRH	UDF	GPoT	AIS
6. Translation Result	997	IPoT	GPoT
6a Translation Result	UDF	GPoT	AIS

Notes:
a. Not all events 1, 2 or 3 may occur or need to be acknowledged
b. TBD indicates the acknowledgment mechanism is to be determined, or as agreed to between components
c. UDF: User Defined File (flat file, proprietary file format)

Figure 10.4-2 Acknowledged Events, Commercial to Government



Notes:
a. Acknowledgments among VANs, Translation Points and their customers are matters to be decided by them and are not defined in the government Acknowledgment Model.
b. Some GPoTs may generate a second 242, with the ECPN acting as a pass-through.
c. For government to government scenario, replace the VAN with a GPoT. The ECPN will generate 242s in lieu of TA3s in step 1.

Figure 10.4-3 Acknowledgment Model, Government to Commercial

Sequence / Event	Mechanism	From	To
1. Interchange receipt by ECPN	TA3	ECPN	VAN
(Government to Government)	TA3	ECPN	GPoT
2. Interchange Disposition at GPoT	TA3	GPoT	ECPN
2a. Report of Interchange Disposition at GPoT	242	ECPN	VAN
(Government to Government)	242	ECPN	GPoT
3. Translation Result	997	GPoT	IPoT

Note:
In step 2a, the disposition report carried in a TA3 is mapped to a 242

Figure 10.4-4 Acknowledged Events, Government to Commercial

10.4.2 Interchange Acknowledgment

At the interchange level, acknowledgments can occur for a number of events. Successful translation, syntax error, or a more detailed acknowledgment of the disposition of an interchange can be reported. The available X12 mechanisms for such interchange acknowledgments includes the Functional Acknowledgment (997) transaction set, the Interchange Acknowledgment (TA1), and the Interchange Delivery Notice Segment (TA3). In general, the 997 is used exclusively for reporting the status of syntactical analysis of the interchange by the receiving translator, although it could be used as an indication that an interchange was received. The Interchange Acknowledgment (TA1) is not supported in this acknowledgment model. The Interchange Delivery Notice (TA3) provides the ability for reporting on the status of actions taken on a particular interchange. The manner in which these mechanisms are used, and the features within each that are utilized, provides a set of tools for building a sequence of acknowledgments for the life cycle of an interchange as it flows across an infrastructure.

10.4.2.1 TA3

The purpose of the TA3 is to provide a notice from the receiving SRH to the sending SRH that an interchange was delivered, not delivered, refused, purged, or transferred to the next SRH. It provides a notification of action taken, notice of time/date action was taken, and the ability to report on more than one event.

As an acknowledgment mechanism in this model, the TA3 is used between the ECPN and VANs, as Service Request Handlers, to indicate the status of interchanges sent from the government to commercial components, as well as the reverse scenario. To indicate outbound delivery status, the information contained in this TA3 is further translated into a 242 transaction set and sent to GPoTs for their use, which may include supplying this information to the interchange sender. The government uses the TA3 to indicate interchange delivery status to the sending commercial infrastructure components.

Implementation Note:

1. An interchange that contains a TA3 shall contain only TA3s.

2. An interchange may contain multiple TA3s.

3. Upon delivery to the interchange receiver's mailbox, a TA3 shall be generated.

4. If delivery to the interchange receiver's mailbox is not made within 2 hours, a TA3 shall be generated indicating a non-delivery status. The appropriate reason codes will be specified.

5. No acknowledgment is made for the receipt of a TA3.

10.4.2.2 Data Status Tracking (242) Transaction Set

The Data Status Tracking (242) transaction set conveys status information from a service request handler to the interchange sender, interchange receiver, or both. It can be used to provide status information regarding an interchange as it flows from an interchange sender through one or more service request handlers to an interchange receiver during its transmission cycle.

In the acknowledgment model, the 242 transaction set is used for two events: (1) it conveys information from the TA3 that was generated by the VAN or GPoT that received the interchange, and (2) it is used to provide acknowledgment information between government components. Because it is a transaction set, translation sites can map that information into a UDF for the sending applications use. How this information is used depends on the internal business processes at the application site, and is not covered by the model. In addition, this information may be used by the GPoT in its capacity as a Service Request Handler for internal audit trail purposes.

***Implementation Note**:*

1. For interchanges between government components, a 242 shall be generated upon delivery to the interchange receiver's mailbox. If delivery to the interchange receiver's mailbox is not made within 2 hours, a 242 shall be generated indicating a non-delivery status.

2. The 242 transaction set shall not be acknowledged.

3. Additional 242 acknowledgements from interconnect service providers may be required by additional agreements among trading partners.

10.4.2.3 Interchange Acknowledgment Segment (TA1)

The Interchange Acknowledgment Segment (TA1) is used to acknowledge receipt of one interchange header and trailer envelope.

***Implementation Note:** The TA1 is not supported in this acknowledgment model.*

10.4.3 Application Advice (824) Transaction Set

Although it can provide acknowledgment functionality, use of the Application Advice (824) transaction set is not specified by this model. Currently, it is primarily used on an exception basis for reporting between applications, and its full use as an acknowledgment mechanism within the model would create

substantial impact on the communications and processing systems.

10.4.4 Functional Acknowledgments (997) Transaction Set

While Functional Acknowledgment (997) transaction set is not part of the interchange control structure, it is integral to the overall process for interchange integrity, and for completeness of the acknowledgment model.

Support for the Functional Acknowledgment is required in all cases. The 997 verifies (or challenges) the syntactical correctness (e.g., ability to translate) of transaction-level data within a functional group.

***Implementation Note**: The 997 transaction set shall not be acknowledged.*

10.5 SECURITY

ASC X12.58, published in December, 1996, provides for the implementation of security services at the functional group and transaction set levels. The available security services include: data integrity, confidentiality, authentication, verification, assurance and non-repudiation of origin. These services may be implemented individually or in any combination.

ASC X12.58 can meet several security objectives. Among these are:

- The recipient of an EDI transaction can verify the individual identity of the originator of the transaction, and the authorization of the origination.
- The recipient of an EDI transaction can verify the integrity of its contents.
- The originator of an EDI transaction can provide confidentiality for its contents.

ASC X12.58 provides a mechanism that can be applied to the X12 functional group or transaction set, in contrast to other alternatives which are usually applied to the entire interchange. ANSI X12.58 is transaction data independent. When X12.58 security mechanisms are applied inside the interchange, they can be handled and routed as standard X12 transactions without disrupting the end-to-end security. Since security services are applied within the interchange, they are independent of the mechanism used to transport them. Thus X12.58 can provide security even when the interchanges leave the boundaries of the ECI.

ASC X12.58 is based on a secret key with extensions for public keying. This approach is used for authentication and encryption using standard DES (Data Encryption Standard) modes. Key management is usually DES-based. The X12.58 security mechanism relies on the availability of International Telecommunications Union (ITU) X.509 certificates for the EDI originators and recipients. These certificates are used to create and verify digital signatures, and to produce the keys for the encryption of transactions.

The security segments and codes are described in Section 10.6 of this document.

10.5.1 Authentication

- Message authentication is a procedure to verify that received messages have not been altered. A hash function, a public function that maps a message of any length into a fixed hash value, can be used as an authenticator when used in

conjunction with some form of data encryption, such as digital signature.

Implementation Note: *Assurance via the S2A/SVA segments shall be used in lieu of authentication.*

10.5.2 Confidentiality (Encryption)

The X12.58 standards allows for the implementation of various algorithms to encrypt X12 transactions. Cryptographic algorithms fall into two categories: secret key and public-key. Secret key algorithms are based on both the sender and receiver sharing the same secret key (i.e., key unknown to other parties). This key is used to encrypt the transaction prior to transmission and decrypt it upon receipt. Public-key algorithms are based on both sender and receiver having a pair of keys, one public and one private. All exchanges of keys between sender and receiver is limited to the public portion only, so the private key portion is protected. Initially, the Government will support the following encryption algorithms:

- Data Encryption Standard (DES)
- Triple DES (DE3)
- Rivest-Shamir-Adleman (RSA)
- SKIPJACK

Implementation Note:

1. Confidentiality services may be applied at either the functional group (GS/GE) level, the transaction set (ST/SE) level or both.

2. . When applied, the S1S shall be inserted immediately after the GS segment and the S1E shall be inserted immediately prior to the GE segment

3. When applied, the S2S shall be inserted immediately after the ST segment and the S2E shall be inserted immediately prior to the SE segment.

10.5.3 Assurance (Digital Signatures)

A digital signature is an authentication technique that also includes measures to counter repudiation by the source. Assurances (S1A or S2A and SVA), as defined in X12.58, allow the originator of the transaction to express "business intent" via a digital signature. The Government will support implementation of the Digital Signature Standard. When used, one S2A and one SVA are inserted immediately before the SE segment of the transaction set being assured. If subsequent assurances are

applied, additional S2A/SVA pairs are inserted between the previous assurance, and the SE segment of the transaction set being assured. Detailed instructions for the use of the S2A and SVA segments are contained in section 10.6

Implementation Note:

1. Assurance (digital signature) may be applied at either the functional group (GS/GE) level, the transaction set (ST/SE) level or both.

2. When digital signature is applied at the group level, the S1A and SVA segment pair(s) shall be inserted immediately preceding the GE segment of the group being assured (digitally signed).

3. When digital signature is applied at the transaction set level, the S1A and SVA segment pair(s) shall be inserted immediately preceding the SE segment of the transaction set being assured (digitally signed).

4. When both assurance and confidentiality are applied, assurance (S1A or S2A and SVA) shall be applied first and then confidentiality (S1S and S1E or S2S and S2E).

10.6 Interchange Control and Acknowledgment Segment Specifications

This section contains the implementation conventions for the:

- Interchange Control Header (ISA)
- Interchange Delivery Notice Segment (TA3)
- Functional Group Header (GS)
- Security Header (S1S)
- Assurance Level 2 (S1A)
- Security Value (SVA)
- Security Trailer (S1E)
- Functional Group Trailer (GE)
- Interchange Control Trailer (IEA).

Implementation conventions for confidentiality and assurance (Digital Signature) to be applied within transaction sets are also included at the end of the section:

- Security Header (S2S)
- Assurance Level 2 (S2A)
- Security Value (SVA)
- Security Trailer (S2E)

Note: N/U is used in the left hand column on the following pages to indicate that the element is Not Used.

Segment: **ISA** **Interchange Control Header**
Usage: Mandatory
Max Use: 1
Purpose: To start and identify an interchange of zero or more functional groups and interchange-related control segments
Syntax Notes:
Semantic Notes:
Comments:
Notes:

1. Use ASCII Hexadecimal 1D in the fourth byte of the Interchange Control Header. This first occurrence of an element separator dictates the value the translation software will employ throughout the interchange.

2. Use ASCII Hexadecimal 1C after ISA16. This first occurrence of a segment terminator dictates the value the translation software employs throughout the interchange.

3. See ISA16 for subelement separator usage.

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
Must Use	**ISA01**	**I01**	**Authorization Information Qualifier** Code to identify the type of information in the Authorization Information 00 No Authorization Information Present (No Meaningful Information in I02) 05 Department of Defense (DoD) Communication Identifier ***Use to indicate the Department of Defense (DOD) as the information authorizer. Use this code even if the sender is not a DOD entity.*** 06 United States Federal Government Communication Identifier ***Use to indicate the Federal Government as the information authorizer. Use this code even if the sender is not a Federal Government entity.***	**M ID 2/2**
Must Use	**ISA02**	**I02**	**Authorization Information** Information used for additional identification or authorization of the interchange sender or the data in the interchange; the type of information is set by the Authorization Information Qualifier (I01) ***1. Use to provide additional identification or authorization for the data in the interchange. Otherwise, fill this field with blank characters.*** ***2. When used, it is recommended that the specific coding be exchanged between trading partner data security officials to ensure preservation of data security.***	**M AN 10/10**
Must Use	**ISA03**	**I03**	**Security Information Qualifier** Code to identify the type of information in the Security Information 00 No Security Information Present (No Meaningful Information in I04) 01 Password	**M ID 2/2**

Use based on trading partner agreement.

Must Use **ISA04** **I04** **Security Information** **M AN 10/10**
This is used for identifying the security information about the interchange sender or the data in the interchange; the type of information is set by the Security Information Qualifier (I03)
If ISA03 is code 00, fill this field with blank characters. Otherwise, enter a password as agreed between Trading Partners.

Must Use **ISA05** **I05** **Interchange ID Qualifier** **M ID 2/2**

Qualifier to designate the system/method of code structure used to designate the sender or receiver ID element being qualified
D-U-N-S (Code 01) or D-U-N-S+4 (Code 16) are prefered.

01	Duns (Dun & Bradstreet)
02	SCAC (Standard Carrier Alpha Code)
04	IATA (International Air Transport Association)
08	UCC EDI Communications ID (Comm ID)
09	X.121 (CCITT)
10	Department of Defense (DoD) Activity Address Code
16	Duns Number With 4-Character Suffix

Must Use **ISA06** **I06** **Interchange Sender ID** **M AN 15/15**
Identification code published by the sender for other parties to use as the receiver ID to route data to them; the sender always codes this value in the sender ID element
1. Enter the identifier of the sender's translation point.

2. Left justify and pad on the right with blanks.

Must Use **ISA07** **I05** **Interchange ID Qualifier** **M ID 2/2**
Qualifier to designate the system/method of code structure used to designate the sender or receiver ID element being qualified
D-U-N-S (Code 01) or D-U-N-S+4 (Code 16) are prefered.

01	Duns (Dun & Bradstreet)
02	SCAC (Standard Carrier Alpha Code)
04	IATA (International Air Transport Association)
08	UCC EDI Communications ID (Comm ID)
09	X.121 (CCITT)
10	Department of Defense (DoD) Activity Address Code
16	Duns Number With 4-Character Suffix
ZZ	Mutually Defined

1. Use to indicate the interchange contains PUBLIC transactions.

2. May be used only by government entities.

Must Use **ISA08** **I07** **Interchange Receiver ID** **M AN 15/15**
Identification code published by the receiver of the data; When sending, it is used by the sender as their sending ID, thus other parties sending to them will use this as a receiving ID to route data to them
1. Enter the identifier of the receiver's translation point (both government and non-government).

2. Left justify and pad on the right with blanks.

3. If the interchange contains PUBLIC transactions, enter the literal string 'PUBLIC '.

Must Use ISA09 I08 Interchange Date M DT 6/6
Date of the interchange

1. Express the UTC (previously known as GMT) date that this interchange was created.

2. Express the date in a six-position (YYMMDD) format.

Must Use ISA10 I09 Interchange Time M TM 4/4
Time of the interchange

1. Express the UTC (previously known as GMT) time that this interchange was created.

2. Express the time in a four-position (HHMM) format.

Must Use ISA11 I10 Interchange Control Standards Identifier M ID 1/1
Code to identify the agency responsible for the control standard used by the message that is enclosed by the interchange header and trailer

U U.S. EDI Community of ASC X12, TDCC, and UCS

Must Use ISA12 I11 Interchange Control Version Number M ID 5/5
This version number covers the interchange control segments

Use to identify the ASC X12 version and release for the interchange envelope, not the transactions carried within the envelope.

00307 Draft Standards for Trial Use Approved for Publication by ASC X12 Procedures Review Board through October 1996

Must Use ISA13 I12 Interchange Control Number M N0 9/9
A control number assigned by the interchange sender

Originating activities may use any numbering scheme consistent with their business practices. However, the scheme must uniquely identify each interchange over a very long period of time.

Must Use ISA14 I13 Acknowledgment Requested M ID 1/1
Code sent by the sender to request an interchange acknowledgment (TA1)

This request for acknowledgement applies only to return of a TA1, Interchange Acknowledgement. It does not apply to other acknowledgements (e.g. TA3 or transaction set 242) as required by Part 10 of the Federal Guidelines. Since the TA1 is not supported, no acknowledgment shall be requested.

0 No Acknowledgment Requested

Use this code to indicate an interchange acknowledgement via TA1 shall not be returned by the interchange receiver.

Must Use ISA15 I14 Test Indicator M ID 1/1
Code to indicate whether data enclosed by this interchange envelope is test or production

P Production Data

Use to identify all data other than test data.

T Test Data

Use when testing interchanges.

Must Use ISA16 I15 Component Element Separator M AN 1/1
This field provides the delimiter used to separate component data elements

within a composite data structure; this value must be different than the data element separator and the segment terminator
Enter ASCII Hexadecimal 1F. The value of this element dictates the value the translation software employs for component element separation throughout the interchange.

Segment: **TA3** **Interchange Delivery Notice Segment**
Usage: Optional, but an interchange that contains TA3s, shall contain only TA3s.
Max Use: >1
Purpose: To provide a notice from the receiving service request handler to the sending service request handler that an interchange was delivered or not delivered to the interchange receiver's mailbox, or some other ancillary service was performed, and that the interchange receiver retrieved, refused, or purged the interchange; TA3 is exchanged only between service request handlers; use of the TA3 segment is optional
Syntax Notes:
1 If either TA322 or TA323 is present, then the other is required.
2 If either TA324 or TA325 is present, then the other is required.
3 If either TA326 or TA327 is present, then the other is required.
Semantic Notes:
1 TA301 and TA302 identify the service request handlers processing the interchange being reported.
2 TA304 through TA311 and TA318 through TA321 are used to identify the interchange whose status is being reported.
3 TA312 through TA314 identify the action being reported and the date and time that action was performed. TA315 through TA317 provide a second set of interchange action code, date and time that can be included if a given TA3 is reporting on more than one event.
4 TA322 through TA327 contain optional information exchanged by service request handlers to supply additional information concerning actions taken upon the interchange being reported.
Comments:
Notes:

1. Only one interchange action may be reported per TA3. If multiple events are to be reported, multiple TA3s must be used.

2. Only one interchange control structure error may be reported per TA3. If multiple errors are to be reported, multiple TA3s must be used.

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**TA301**	**I38**	**Service Request Handler ID Qualifier** This is a code identifying the service request handler ***Cite the code FG to indicate the Federal Government. Do so whether the originator is a public or private organization.***	**M**	**ID**	**2/2**
Must Use	**TA302**	**I39**	**Service Request Handler ID** This is the identification code of the sending service request handler ***Cite the D-U-N-S or D-U-N-S+4 of the service request handler providing this notice of interchange delivery.***	**M**	**AN**	**1/15**
Must Use	**TA303**	**I43**	**Error Reason Code** The code indicates the error found or not found in processing the interchange control structure or in delivering the interchange 000 No Errors 001 The Interchange Control Number in the Header and Trailer Do not Match; the Value from the Header is used in the Acknowledgment 002 This Standard as Noted in the Control Standards Identifier is not Supported	**M**	**ID**	**3/3**

003	This Version of the Controls is not Supported
004	The Segment Terminator is Invalid
005	Invalid Value as Shown in the Reported Interchange Control Number
006	Invalid Value as Shown in the Reported Interchange Date
007	Invalid Value as Shown in the Reported Interchange Time
008	Invalid Value as Shown in the Reported Interchange Sender ID Qualifier
009	Invalid Value as Shown in the Reported Interchange Sender ID
010	Invalid Value as Shown in the Reported Interchange Receiver ID Qualifier
011	Invalid Value as Shown in the Reported Interchange Receiver ID
012	Invalid Value as Shown in the First Reference ID Qualifier
013	Invalid Value as Shown in the First Reference ID
014	Invalid Value as Shown in the Second Reference ID Qualifier
015	Invalid Value as Shown in the Second Reference ID
016	Trading Partnership not Established
017	Invalid Number of Included Groups Value
018	Invalid Control Structure
019	Improper (Premature) End-of-file (Transmission)
020	Duplicate Interchange Control Number
021	Invalid Data Element Separator
022	Invalid Component Element Separator
023	Failure to Transfer Interchange to the next Service Request Handler
024	Invalid Delivery Date in Deferred Delivery Request
025	Invalid Delivery Time in Deferred Delivery Request
026	Invalid Delivery Time Code in Deferred Delivery Request
027	Invalid Grade of Service Code
028	Time Out, Not Delivered
029	Time Out, Delivered
030	Time Out, Processed
031	Receiver Not On-line
032	Abnormal Conditions
033	Interchange Exceeds Maximum Size

Must Use TA304 I44 Reported Start Segment ID M AN 2/3
This contains the interchange start segment ID of the original interchange
For ANSI ASC X12 interchanges, the start segment ID is always ISA.

Must Use TA305 I45 Reported Control Number M AN 1/14
This is the interchange control number value of original interchange
Cite the control number assigned in the original interchange control

header (appearing in ISA13) for which notice is being provided. With this control number, the TA3 is linked to the original interchange envelope.

Must Use TA306 I46 Reported Date M AN 1/8
This is the interchange date value of original interchange
Cite the date appearing in ISA09 of the interchange for which delivery notice is being provided.

Must Use TA307 I47 Reported Time M AN 1/8
This is the interchange time value of original interchange
Cite the time appearing in ISA10 of the interchange for which delivery notice is being provided.

Must Use TA308 I48 Reported Interchange Sender ID Qualifier M AN 1/4
This is the sender ID qualifier value appearing in original interchange
Cite the value appearing in ISA05 of the interchange for which delivery notice is being provided.

Must Use TA309 I49 Reported Sender ID M AN 1/35
This is the sender ID value appearing in original interchange
Cite the value appearing in ISA06 of the interchange for which delivery notice is being provided.

Must Use TA310 I50 Reported Interchange Receiver ID Qualifier M AN 1/4
This is the receiver ID qualifier value appearing in original interchange
Cite the value appearing in ISA07 of the interchange for which delivery notice is being provided.

Must Use TA311 I51 Reported Receiver ID M AN 1/35
This is the receiver ID value appearing in original interchange
Cite the value appearing in ISA08 of the interchange for which delivery notice is being provided.

Must Use TA312 I40 Action Code M ID 2/2
This is a code indicating the action taken on the interchange by the service request handler or the interchange receiver

AK	Transfer to the Next Service Request Handler has been Acknowledged
BH	Transfer to Service Request Handler not Capable of Reporting Further Status
DL	Delivered Interchange by Service Request Handler
PU	Purged by Interchange Receiver
RD	Redirected by Service Request Handler to an Alternate Receiver as Identified in the Reference Code
RF	Refused by Interchange Receiver
RJ	Rejected by Service Request Handler; See Error Reason Code for Cause
RT	Retrieved Interchange by Receiver
TR	Transferred to Next Service Request Handler by Service Request Handler, but not yet Acknowledged

Must Use TA313 I41 Action Date M DT 6/6
This is the UTC date when the service request handler took action on the reported interchange
Express the UTC (previously known as GMT) date in a six-position (YYMMDD) format.

Must Use TA314 I42 Action Time M TM 4/6
This is the UTC time when the service request handler took action on the

reported interchange
Express the UTC (previously known as GMT) time in a four-position (HHMM) format.

N/U	**TA315**	**I40**	**Action Code** This is a code indicating the action taken on the interchange by the service request handler or the interchange receiver Refer to 003070 Data Element Dictionary for acceptable code values.	**O**	**ID**	**2/2**
N/U	**TA316**	**I41**	**Action Date** This is the UTC date when the service request handler took action on the reported interchange	**O**	**DT**	**6/6**
N/U	**TA317**	**I42**	**Action Time** This is the UTC time when the service request handler took action on the reported interchange	**O**	**TM**	**4/6**
N/U	**TA318**	**I52**	**First Reference ID Qualifier** This is the ID qualifier appearing in original interchange	**O**	**AN**	**1/4**
N/U	**TA319**	**I53**	**First Reference ID** This contains information from the original interchange, as defined by the First Reference ID Qualifier data element	**O**	**AN**	**1/14**
N/U	**TA320**	**I54**	**Second Reference ID Qualifier** This contains ID qualifier information appearing in original interchange	**O**	**AN**	**1/4**
N/U	**TA321**	**I55**	**Second Reference ID** This contains information from the original interchange, as defined by the Second Reference ID Qualifier data element	**O**	**AN**	**1/14**
	TA322	**I56**	**Reference Code Qualifier** This is a code defining the information contained in the Reference Code data element ***If TA312 is code RD, use TA322 and TA323 to identify the organization to which the interchange was redirected.*** 05 ID of Alternate Receiver to which Interchange Has Been Redirected	**X**	**ID**	**2/2**
	TA323	**I57**	**Reference Code** This contains reference information exchanged between service request handlers concerning the reported interchange as defined by the corresponding Reference Code Qualifier data element ***Cite the identifier of the organization to which the interchange was redirected. The orgainization shall be identified via a unique identifier from one of the sources listed as allowable codes in the ISA05 definition in section 10.6 of the Federal EDI Guidelines. The Data Universal Numbering System (D-U-N-S) number and D-U-N-S +4 are the prefered identifiers.***	**X**	**AN**	**1/35**
N/U	**TA324**	**I56**	**Reference Code Qualifier** This is a code defining the information contained in the Reference Code data element	**X**	**ID**	**2/2**
N/U	**TA325**	**I57**	**Reference Code** This contains reference information exchanged between service request handlers concerning the reported interchange as defined by the corresponding Reference Code Qualifier data element	**X**	**AN**	**1/35**
N/U	**TA326**	**I56**	**Reference Code Qualifier** This is a code defining the information contained in the Reference Code data element	**X**	**ID**	**2/2**
N/U	**TA327**	**I57**	**Reference Code** This contains reference information exchanged between service request	**X**	**AN**	**1/35**

handlers concerning the reported interchange as defined by the corresponding Reference Code Qualifier data element

Segment: **GS** **Functional Group Header**
Usage: Optional
Max Use: >1
Purpose: To indicate the beginning of a functional group and to provide control information
Syntax Notes:
Semantic Notes:
1 GS04 is the group date.
2 GS05 is the group time.
3 The data interchange control number GS06 in this header must be identical to the same data element in the associated functional group trailer, GE02.
Comments:
1 A functional group of related transaction sets, within the scope of X12 standards, consists of a collection of similar transaction sets enclosed by a functional group header and a functional group trailer.
Notes:

1. Use to identify the functional group containing one or more related transactions.

2. Use to identify the specific implementation convention with which the transaction sets contained within the functional group envelope comply.

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
Must Use	**GS01**	**479**	**Functional Identifier Code** Code identifying a group of application related transaction sets ***Cite any valid code defined for data element 479 in the ASC X12 Standards Data Element Dictionary providing a Federal implementation convention exists for the cited transaction set.*** Refer to 003070 Data Element Dictionary for acceptable code values.	**M ID 2/2**
Must Use	**GS02**	**142**	**Application Sender's Code** Code identifying party sending transmission; codes agreed to by trading partners ***1. Cite the sending application's identifier. This identifier must be unique within the domain of the sending application's translation point. Use of a Dun and Bradstreet number (D-U-N-S or D-U-N-S+4) is recommended to provide universal uniqueness.*** ***2. Transmit the required number of characters without leading or trailing blanks.***	**M AN 2/15**
Must Use	**GS03**	**124**	**Application Receiver's Code** Code identifying party receiving transmission. Codes agreed to by trading partners ***1. Cite the receiving application's identifier. This identifier must be unique within the domain of the receiving application's translation point. Use of a Dun and Bradstreet number (D-U-N-S or D-U-N-S+4) is recommended to provide universal uniqueness.*** ***2. Transmit the required number of characters without leading or trailing blanks.*** ***3. If the group contains PUBLIC transactions, enter the literal string 'PUBLIC'.***	**M AN 2/15**

Must Use	**GS04**	**373**	**Date**	**M**	**DT**	**6/6**

Date (YYMMDD)

1. Enter the UTC (previously known as GMT) date that this segment was created.

2. Express the date in a six-position (YYMMDD) format.

Must Use	**GS05**	**337**	**Time**	**M**	**TM**	**4/8**

Time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H = hours (00-23), M = minutes (00-59), S = integer seconds (00-59) and DD = decimal seconds; decimal seconds are expressed as follows: D = tenths (0-9) and DD = hundredths (00-99)

1. Enter the UTC (previously known as GMT) time that this segment was created.

2. Express the time in a four-position (HHMM) format.

Must Use	**GS06**	**28**	**Group Control Number**	**M**	**N0**	**1/9**

Assigned number originated and maintained by the sender

1. Originating activities may use any numbering scheme consistent with their business practices.

2. The scheme must provide sufficient uniqueness to identify each functional group. The Group Control Number value, together with the Application Sender's and Receiver's Codes, shall be unique within an extended time frame - such as a year.

Must Use	**GS07**	**455**	**Responsible Agency Code**	**M**	**ID**	**1/2**

Code used in conjunction with Data Element 480 to identify the issuer of the standard

X Accredited Standards Committee X12

Must Use	**GS08**	**480**	**Version / Release / Industry Identifier Code**	**M**	**AN**	**1/12**

Code indicating the version, release, subrelease, and industry identifier of the EDI standard being used, including the GS and GE segments; if code in DE455 in GS segment is X, then in DE 480 positions 1-3 are the version number; positions 4-6 are the release and subrelease, level of the version; and positions 7-12 are the industry or trade association identifiers (optionally assigned by user); if code in DE455 in GS segment is T, then other formats are allowed

Cite the implementation Convention with which the following transactions comply. See Section 10.2.1.2 of the Federal Government Implementation Guidelines for a description of the structure of this citation.

Refer to 003070 Data Element Dictionary for acceptable code values.

Segment: **S1S** **Security Header Level 1**
Usage: Optional
Max Use: 1
Purpose: To initiate the beginning of a secured area and to provide the parameters needed for authentication or encryption of a functional group
Syntax Notes:
1 If either S1S04 or S1S05 is present, then the other is required.
2 If any of S1S06 S1S07 S1S08 or S1S09 is present, then all are required.
3 If either C03204 or C03205 is present, then the other is required.
4 If either C03206 or C03207 is present, then the other is required.
Semantic Notes:
1 If S1S01 is "AA", "BB", "AC" or "BC", then S1S04 is required.
If S1S01 is "BB", "EE", "AC" or "EC", then S1S06 is required.
Comments:
1 X9 has a required minimum length of four characters for S1S02 (security originator). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
2 X9 has a required minimum length of four characters for S1S03 (security recipient). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
3 In S1S04, the special name "01234567890ABCDEF" is reserved for the hexadecimal value 01234567890ABCDEF (i.e., a fixed, nonsecret value) to provide a well-known value for data-integrity testing only.

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
Must Use	**S1S01**	**990**	**Security Type** Code identifying the security algorithms and methods employed for this level of interchange. EC No Authentication, Compression, Encryption EE No Authentication, No Compression, Encryption	**M ID 2/2**
Must Use	**S1S02**	**824**	**Security Originator Name** Unique designation (identity) of the cryptographic process that performs authentication or encryption on data to be interchanged, or originates a cryptographic service message Note: X9 has a minimum length of 4 characters for the security originator; no mechanism, or registration method is provided by X9 or X12 to guarantee the uniqueness of the identifier	**M AN 1/64**
	S1S03	**825**	**Security Recipient Name** Unique designation (identity) of the cryptographic process that performs authentication or decryption on received data, or is the destination of a cryptographic service message Note: X9 has a minimum length of 4 characters for the security recipient; no mechanism, or registration method is provided by X9 or X12 to guarantee the uniqueness of the identifier	**O AN 1/64**
	S1S04	**991**	**Authentication Key Name** Name of the key used for authentication; this name is mutually known to the security originator and the security recipient, is unique for this relationship, and is intended to allow the changing of the key from time to time	**X AN 1/64**

Note: The special key name "0123456789ABCDEF" is reserved for the hexidecimal value 0123456789ABCDEF (i.e. a fixed non-secret value) to provide a well-known value for data integrity testing only)

	S1S05	**992**	**Authentication Service Code** Authentication option 4 MD5 Hash 5 SHA Hash	**X**	**ID**	**1/1**
	S1S06	**C031**	**Encryption Key Information** Information needed to identify or obtain the encryption key	**X**		
Must Use	**C03101**	**993**	**Encryption Key Name** Name of the key used for encryption; this name is mutually known to the security originator and the security recipient, is unique for this relationship, and is intended to allow the changing of the key from time to time Note: If any of the optional fields are present, the Key Name should contain either "PUBLIC" if a public key is being used to encrpyt the one-time key or the actual name of the asymmetric key-encrypting-key used to encrypt the one-time key.	**M**	**AN**	**1/64**
	C03102	**1564**	**Protocol ID** Code specifying protocol used to encrypt the session key KEA Key Encryption Algorithm RSA RSA Algorithm ZZZ Mutually Defined ***Use to indicate Data Encryption Standard (DES).***	**O**	**ID**	**3/3**
	C03103	**1565**	**Look-up Value** Value used to identify a certificate containing a public key	**O**	**AN**	**1/4096**
	C03104	**1566**	**Keying Material** Additional material required for decrypting the one-time key	**O**	**AN**	**1/512**
	C03105	**1567**	**One-time Encryption Key** Hexadecimally filtered encrypted one-time key	**O**	**AN**	**1/512**
	S1S07	**C032**	**Encryption Service Information** Information required by the encryption operation	**X**		
Must Use	**C03201**	**994**	**Encryption Service Code** Coded values representing options for encryption processing. The code defines the encryption mode and the transmission filter specification for filtering binary ciphertext data into transmittable text. 20 ANSI X9.23 Cipher Block Chaining (CBC), No Filter (Binary Cipher Text) 21 ANSI X9.23 Cipher Block Chaining (CBC), Hexadecimal Filter 22 ANSI X9.23 Cipher Block Chaining (CBC), ASCII Filter 40 ANSI X9.23 CFB-8 (Cipher Feedback); No Filter (Binary Cipher Text) 41 ANSI X9.23 CFB-8 (Cipher Feedback), Hexadecimal Filter 42 ANSI X9.23 CFB-8 (Cipher Feedback), ASCII Filter	**M**	**ID**	**1/3**

C03202	**1568**	**Algorithm ID**	**O**	**ID**	**3/3**
		Algorithm used for Encryption			
		DE3 Triple DEA			
		Use to indicate Triple DES.			
		DES Data Encryption Standard (Same as DEA)			
		SKJ Skipjack			
		SKIPJACK (SKJ) is a government approved cryptographic algorithm used in Fortezza. The SKIPJACK algorithm's Initialization Vector (IV) requires 24 bytes. The IV field (S2S09) is limited to 16 characters (bytes). Therefore, a SKIPJACK IV does not fit. Since the encrypted, filtered data immediately follows the IV, the remaining characters of the IV will spill over into the area normally containing the encrypted data. If SKIPJACK is used, the S2S Segment will be in technical violation of the ASC X12 standard, since S1S09 will exceed 16 bytes.			
		ZZZ Mutually Defined			
		Use to indicate RSA Algorithim.			
C03203	**1569**	**Algorithm Mode of Operation**	**O**	**ID**	**3/3**
		CBC Cipher Block Chaining			
		ZZZ Mutually Defined			
		Use to indicate Cipher Feedback (CFB) Mode			
C03204	**1570**	**Filter ID Code**	**X**	**ID**	**3/3**
		Code specifying the type of filter used to convert data code values			
		ASC ASCII Filter			
		HDC Hexadecimal Filter			
		R64 Radix 64			
		Use to indicate Base 64.			
C03205	**799**	**Version Identifier**	**X**	**AN**	**1/30**
		Revision level of a particular format, program, technique or algorithm			
C03206	**1571**	**Compression ID**	**X**	**ID**	**3/3**
		Type of Compression Used			
		Refer to 003070 Data Element Dictionary for acceptable code values.			
C03207	**799**	**Version Identifier**	**X**	**AN**	**1/30**
		Revision level of a particular format, program, technique or algorithm			
		Cite the version of the compression algorithm cited in S1S07 (C03206) above.			
S1S08	**995**	**Length of Data**	**X**	**N**	**1/18**
		Length of data is the number of character positions of the encrypted, filtered text.			
S1S09	**996**	**Initialization Vector**	**X**	**AN**	**16/16**
		The archival representation of a 64-bit value expressed in hexadecimal notation as 16 ASCII characters from the set of characters (0..9, A..F); the 64-bit value is used as a starting point for encryption of a data sequence to increase security by introducing cryptographic variance and to synchronize cryptographic equipment; a new Initialization Vector (IV) shall be used for each message; the IV shall not be intentionally reused; the 64-bit binary			

value, not its ASCII representation, is used for the cryptographic process; in the interchange process, the resultant encrypted and filtered 64-bit IV is sent; the hexadecimal notation is the representation for archiving purposes; the IV shall be a random or pseudo-random number; when encrypted, the IV must be decrypted using the Electronic Code Book (ECB) mode and the same key used to encrypt the message

Segment: **S1A** **Assurance Level 1**
Usage: Optional
Max Use: 1
Purpose: To allow for multiple assurances at the GS/GE level
Syntax Notes:
1 If C02804 is present, then C02803 is required.
2 If C02806 is present, then C02805 is required.
3 If C02808 is present, then C02807 is required.
4 If C02810 is present, then C02809 is required.
5 If C02812 is present, then C02811 is required.
6 If C02814 is present, then C02813 is required.
7 If C02816 is present, then C02815 is required.
8 If C02818 is present, then C02817 is required.
9 If C02820 is present, then C02819 is required.

Semantic Notes:

Comments:
1 X9 has a required minimum length of four characters for S1A04 (security originator). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
2 X9 has a required minimum length of your characters for S1A05 (security recipient). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
3 The date/time stamp may determine which of several key values apply, depending on start and expiration dates of different key values that may share the same keyname.
4 Key distribution is performed by other means and thus only onetime keys are allowed in S1A09.
The use of particular codes and corresponding values in S1A09 is dependent on the exigencies of the various cryptographic algorithms.

Notes: ***Assurance (Digital Signature) segments (S1A/SVA) are not part of the control envelope structure. When used, insert the S1A/SVA segment pair(s) immediately preceding the GE segment of the group for which assurance is being provided. See Section 10.5.2 of the Federal Implementation Guidelines.***

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
Must Use	**S1A01**	**1432**	**Business Purpose of Assurance** The stated business purpose for appending the assurance to an existing secured-entity (whether functional group or transaction set); the codes represent the intention of the business or application that has control over the assurance originator ASG Authorization Signature Appropriate to this Document CSG Authorization Co-signature Appropiate to this Document	**M ID 3/3**
Must Use	**S1A02**	**C034**	**Computation Methods** Algorithms used to calculate an assurance	**M**
Must Use	**C03401**	**1574**	**Assurance Algorithm** Code specifying the algorithm used to compute the assurance token DSS Digital Signature Standard RSA RSA	**M ID 3/3**

Must Use	**C03402**	**1575**	**Hashing Algorithm** Code specifying the algorithm used to compute the assurance digest Refer to 003070 Data Element Dictionary for acceptable code values.	**M**	**ID**	**3/3**
Must Use	**S1A03**	**1434**	**Domain of Computation of Assurance Digest** The bounds of the text, whether contiguous or not, over which the computation of the Assurance Token is computed using the defined methodology of computation and any relevant Assurance Token parameters; the "body" is either a transaction set (beginning with the ST and including all segments up to the first S4A segment, but excluding any S4S segment) or functional group (beginning with the GS and including all transaction sets up to the first S1A segment, but excluding any S1S segment "This Assurance" is defined as from the "S" in S1A or S2A up to and including the data element separator preceeding the assurance digest "Previous Assurance(s)" is defined as including the entire S1A or S2A segment and the entire SVA that follows the included S1A or S2A A Body Only B Body plus This Assurance Only C Body plus All Previous Assurances plus This Assurance D Body plus All Previous Assurances Only E This Assurance Only F All Previous Assurances plus This Assurance	**M**	**ID**	**1/2**
	S1A04	**1435**	**Assurance Originator** Unique designation (identity) of the cryptographic process that performs the stated assurance on data to be interchanged Note: X9 has a required minimum length of 4 characters for a security originator; no mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier	**O**	**AN**	**1/64**
	S1A05	**1436**	**Assurance Recipient** Unique designation (identity) of the cryptographic process that performs validation of the stated assurance on received data. In the absence of an Assurance Recipient all potenial receivers will often be able to validate the assurance because the cryptographic technique is based on a "public" (as opposed to "secret") technology Note: X9 has required minimum length of 4 characters for a security recipient; no mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier	**O**	**AN**	**1/64**
	S1A06	**1443**	**Assurance Reference Number** Alphanumeric reference number issued by security assurance originator for the particular assurance in which it occurs; unique when used in combination with security originator data element	**O**	**AN**	**1/35**
	S1A07	**1437**	**Date/Time Reference** Date/time stamp in format as follows: YYYYMMDDHHNNSSTTTZZZ+XXXX, where YYYY = 4 digit year (with leading century), MM = month of year (01..12), DD = day of month	**O**	**AN**	**17/25**

(01..31), HH = hour of day in 24-hour format (00..23), NN = minutes of the hour (00-59), SS = second of hour (00..59), TTT = [optional] milli-seconds (000..999), ZZZ = [optional] three character, nominal timezone indicator (including daylight savings time indicator) and XXXXX = 3-5 digit (including leading + or - sign) offset of time to universal time, with three position format indicating hours-offset for whole hours, and five position format indicating hours and minutes offset where this is necessary. For example:

1993061522133OCDT+0930 which represents 15 June 1993, 22:13 (10:13pm), Central Daylight Time (Nominal Value "CDT"), in a timezone that is offset + 9:30 from Universal Time (Australia)

	S1A08	**1438**	**Assurance Text**	**O**	**AN**	**1/64**
			Any text needed to convey the name of a signatory, registration number, certification number, or other assurance-originator defined or mutually-agreed business text related to the specific assurance; this text is not defined for X12 purposes and thus functions technically as "free form text" though it may have structure that is defined by the assurance originator, an industry group, a governmental agency, or bi-laterally between assurance originator and assurance recipient			
	S1A09	**C028**	**Assurance Token Parameters**	**O**		
			Parameters needed to calculate the Assurance Token			
Must Use	**C02801**	**1439**	**Assurance Token Parameter Code**	**M**	**ID**	**2/2**
			A code specifying the type of Assurance Token Parameter			
			CI Certification Authority ID			
			EK Key Value - One-Time Key			
			KN Key Name			
			NT Notarization			
			OD Key-Encrypting-Key for One-Time Key			
			UI User ID			
Must Use	**C02802**	**1442**	**Assurance Token Parameter Value**	**M**	**AN**	**1/64**
			A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required			
N/U	**C02803**	**1439**	**Assurance Token Parameter Code**	**X**	**ID**	**2/2**
			A code specifying the type of Assurance Token Parameter			
N/U	**C02804**	**1442**	**Assurance Token Parameter Value**	**O**	**AN**	**1/64**
			A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required			
N/U	**C02805**	**1439**	**Assurance Token Parameter Code**	**X**	**ID**	**2/2**
			A code specifying the type of Assurance Token Parameter			
N/U	**C02806**	**1442**	**Assurance Token Parameter Value**	**O**	**AN**	**1/64**
			A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required			
N/U	**C02807**	**1439**	**Assurance Token Parameter Code**	**X**	**ID**	**2/2**

			A code specifying the type of Assurance Token Parameter			
N/U	**C02808**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02809**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02810**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02811**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02812**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02813**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02814**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02815**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02816**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02817**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02818**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02819**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02820**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
	S1A10	**1440**	**Assurance Digest** The result of the application of the hash defined in the methodology expressed in ASCII-hex notation	**O**	**AN**	**1/512**

Segment: **SVA** **Security Value**
Usage: Optional
Max Use: 1
Purpose: To provide the encoded output of a cryptographic algorithm
Syntax Notes:
Semantic Notes:
Comments:
Notes: ***Assurance (Digital Signature) segments (S1A/SVA) are not part of the control envelope structure. When used, insert the S1A/SVA segment pair(s) immediately preceding the GE segment of the group for which assurance is being provided. See Section 10.5.3 of the Federal Implementation Guidelines.***

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**SVA01**	**1570**	**Filter ID Code** Code specifying the type of filter used to convert data code values ASB ASCII-Baudot Filter ASC ASCII Filter HDC Hexadecimal Filter R64 Radix 64 UUE Uuencoding	**M**	**ID**	**3/3**
Must Use	**SVA02**	**799**	**Version Identifier** Revision level of a particular format, program, technique or algorithm	**M**	**AN**	**1/30**
Must Use	**SVA03**	**C033**	**Security Value** Value of the Security Token	**M**		
Must Use	**C03301**	**1572**	**Security Value Qualifier** Type of Security Value ASV Assurance Token CRT Certificate PUB Public Key	**M**	**ID**	**3/3**
Must Use	**C03302**	**1573**	**Encoded Security Value** Encoded representation of the Security Value specified by the Security Value Qualifier	**M**	**AN**	**1/1**

Segment: **S1E** **Security Trailer Level 1**
Usage: Optional
Max Use: 1
Purpose: To end a secured area and to provide the value of cryptographically computed authentication codes
Syntax Notes:
Semantic Notes:
Comments:

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**S1E01**	**997**	**Hash or Authentication Code** The message authentication code or hash/digest generated by the authentication process; when the Data Encryption Standard (DES) algorithm is used, the field consists of 4 hexadecimal coded characters (i.e., characters from the set 0..9, A..F), a separator character (space, "-", or other), and 4 hexadecimally coded characters; when non-DES hashes are used, the result of the hash is expressed as hexadecimally coded characters without spaces; when authentication or hash is not used, this field should be filled with a non-blank character other than the set (0..9, A..F) for the minimum length ***Enter the character "Z".***	**M**	**AN**	**1/64**

Segment: **GE** **Functional Group Trailer**
Usage: Optional
Max Use: >1
Purpose: To indicate the end of a functional group and to provide control information
Syntax Notes:
Semantic Notes: **1** The data interchange control number GE02 in this trailer must be identical to the same data element in the associated functional group header, GS06.
Comments: **1** The use of identical data interchange control numbers in the associated functional group header and trailer is designed to maximize functional group integrity. The control number is the same as that used in the corresponding header.

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**GE01**	**97**	**Number of Transaction Sets Included** Total number of transaction sets included in the functional group or interchange (transmission) group terminated by the trailer containing this data element ***1. Use to identify the number of ST segments (transactions) within a functional group.*** ***2. Transmit the required number of characters without leading or trailing blanks.***	**M**	**N0**	**1/6**
Must Use	**GE02**	**28**	**Group Control Number** Assigned number originated and maintained by the sender ***Cite the same group control number as was assigned by the originator in GS06.***	**M**	**N0**	**1/9**

Segment: **IEA** **Interchange Control Trailer**
Usage: Optional
Max Use: 1
Purpose: To define the end of an interchange of zero or more functional groups and interchange-related control segments
Syntax Notes:
Semantic Notes:
Comments:

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**IEA01**	**I16**	**Number of Included Functional Groups** A count of the number of functional groups included in an interchange ***1. Use to identify the number of GS segments (functional groups) within an interchange.*** ***2. Transmit the required number of characters without leading or trailing blanks.***	**M**	**N0**	**1/5**
Must Use	**IEA02**	**I12**	**Interchange Control Number** A control number assigned by the interchange sender ***Cite the same nine-digit interchange control number as was assigned by the originator in ISA13.***	**M**	**N0**	**9/9**

Segment: **S2S** **Security Header Level 2**
Usage: Optional
Max Use: 1
Purpose: To initiate the beginning of a secured area and to provide the parameters needed for authentication or encryption of a transaction set
Syntax Notes:
1 If either S2S04 or S2S05 is present, then the other is required.
2 If any of S2S06 S2S07 S2S08 or S2S09 is present, then all are required.
3 If either C03204 or C03205 is present, then the other is required.
4 If either C03206 or C03207 is present, then the other is required.
Semantic Notes:
1 If S2S01 is "AA", "BB", "AC" or "BC", then S2S04 is required.
If S2S01 is "BB", "EE", "AC" or "EC", then S2S06 is required.
Comments:
1 X9 has a required minimum length of four characters for S2S02 (security originator). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
2 X9 has a required minimum length of four characters for S2S03 (security recipient). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
3 In S2S04 the special name "01234567890ABCDEF" is reserved for the hexadecimal value 01234567890ABCDEF (i.e., a fixed nonsecret value) to provide a well-known value for data-integrity testing only.

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
Must Use	**S2S01**	**990**	**Security Type** Code identifying the security algorithms and methods employed for this level of interchange. EC No Authentication, Compression, Encryption EE No Authentication, No Compression, Encryption	**M ID 2/2**
Must Use	**S2S02**	**824**	**Security Originator Name** Unique designation (identity) of the cryptographic process that performs authentication or encryption on data to be interchanged, or originates a cryptographic service message Note: X9 has a minimum length of 4 characters for the security originator; no mechanism, or registration method is provided by X9 or X12 to guarantee the uniqueness of the identifier	**M AN 1/64**
	S2S03	**825**	**Security Recipient Name** Unique designation (identity) of the cryptographic process that performs authentication or decryption on received data, or is the destination of a cryptographic service message Note: X9 has a minimum length of 4 characters for the security recipient; no mechanism, or registration method is provided by X9 or X12 to guarantee the uniqueness of the identifier	**O AN 1/64**
	S2S04	**991**	**Authentication Key Name** Name of the key used for authentication; this name is mutually known to the security originator and the security recipient, is unique for this relationship, and is intended to allow the changing of the key from time to time	**X AN 1/64**

Note: The special key name "0123456789ABCDEF" is reserved for the hexidecimal value 0123456789ABCDEF (i.e. a fixed non-secret value) to provide a well-known value for data integrity testing only)

	S2S05	**992**	**Authentication Service Code**	**X**	**ID**	**1/1**
			Authentication option			
			4 MD5 Hash			
			5 SHA Hash			
	S2S06	**C031**	**Encryption Key Information**	**X**		
			Information needed to identify or obtain the encryption key			
Must Use	**C03101**	**993**	**Encryption Key Name**	**M**	**AN**	**1/64**
			Name of the key used for encryption; this name is mutually known to the security originator and the security recipient, is unique for this relationship, and is intended to allow the changing of the key from time to time Note: If any of the optional fields are present, the Key Name should contain either "PUBLIC" if a public key is being used to encrpyt the one-time key or the actual name of the asymmetric key-encrypting-key used to encrypt the one-time key.			
	C03102	**1564**	**Protocol ID**	**O**	**ID**	**3/3**
			Code specifying protocol used to encrypt the session key			
			KEA Key Encryption Algorithm			
			RSA RSA Algorithm			
			ZZZ Mutually Defined			
			Use to indicate Data Encryption Standard (DES).			
	C03103	**1565**	**Look-up Value**	**O**	**AN**	**1/4096**
			Value used to identify a certificate containing a public key			
	C03104	**1566**	**Keying Material**	**O**	**AN**	**1/512**
			Additional material required for decrypting the one-time key			
	C03105	**1567**	**One-time Encryption Key**	**O**	**AN**	**1/512**
			Hexadecimally filtered encrypted one-time key			
	S2S07	**C032**	**Encryption Service Information**	**X**		
			Information required by the encryption operation			
Must Use	**C03201**	**994**	**Encryption Service Code**	**M**	**ID**	**1/3**
			Coded values representing options for encryption processing. The code defines the encryption mode and the transmission filter specification for filtering binary ciphertext data into transmittable text.			
			20 ANSI X9.23 Cipher Block Chaining (CBC), No Filter (Binary Cipher Text)			
			21 ANSI X9.23 Cipher Block Chaining (CBC), Hexadecimal Filter			
			22 ANSI X9.23 Cipher Block Chaining (CBC), ASCII Filter			
			40 ANSI X9.23 CFB-8 (Cipher Feedback); No Filter (Binary Cipher Text)			
			41 ANSI X9.23 CFB-8 (Cipher Feedback), Hexadecimal Filter			
			42 ANSI X9.23 CFB-8 (Cipher Feedback), ASCII Filter			

C03202	**1568**	**Algorithm ID**	**O**	**ID**	**3/3**
		Algorithm used for Encryption			
		DE3 Triple DEA			
		Use to indicate Triple DES.			
		DES Data Encryption Standard (Same as DEA)			
		SKJ Skipjack			
		SKIPJACK (SKJ) is a government approved cryptographic algorithm used in Fortezza. The SKIPJACK algorithm's Initialization Vector (IV) requires 24 bytes. The IV field (S2S09) is limited to 16 characters (bytes). Therefore, a SKIPJACK IV does not fit. Since the encrypted, filtered data immediately follows the IV, the remaining characters of the IV will spill over into the area normally containing the encrypted data. If SKIPJACK is used, the S2S Segment will be in technical violation of the ASC X12 standard, since S2S09 will exceed 16 bytes.			
		ZZZ Mutually Defined			
		Use to indicate RSA Algorithim.			
C03203	**1569**	**Algorithm Mode of Operation**	**O**	**ID**	**3/3**
		CBC Cipher Block Chaining			
		ZZZ Mutually Defined			
		Use to indicate Cipher Feedback (CFB) Mode			
C03204	**1570**	**Filter ID Code**	**X**	**ID**	**3/3**
		Code specifying the type of filter used to convert data code values			
		ASC ASCII Filter			
		HDC Hexadecimal Filter			
		R64 Radix 64			
		Use to indicate Base 64.			
C03205	**799**	**Version Identifier**	**X**	**AN**	**1/30**
		Revision level of a particular format, program, technique or algorithm			
C03206	**1571**	**Compression ID**	**X**	**ID**	**3/3**
		Type of Compression Used			
		913 X9E13 Compression as defined by X9.32			
		ZZZ Mutually Defined			
		Use to indicate Internet Engineering Task Force (IETF) Request For Comment (RFC) 1952, Compression (ZIP/GZIP)			
C03207	**799**	**Version Identifier**	**X**	**AN**	**1/30**
		Revision level of a particular format, program, technique or algorithm			
		Cite the version of the compression algorithm cited in S2S07 (C03206) above.			
S2S08	**995**	**Length of Data**	**X**	**N**	**1/18**
		Length of data is the number of character positions of the encrypted, filtered text.			
S2S09	**996**	**Initialization Vector**	**X**	**AN**	**16/16**
		The archival representation of a 64-bit value expressed in hexadecimal notation as 16 ASCII characters from the set of characters (0..9, A..F); the			

64-bit value is used as a starting point for encryption of a data sequence to increase security by introducing cryptographic variance and to synchronize cryptographic equipment; a new Initialization Vector (IV) shall be used for each message; the IV shall not be intentionally reused; the 64-bit binary value, not its ASCII representation, is used for the cryptographic process; in the interchange process, the resultant encrypted and filtered 64-bit IV is sent; the hexadecimal notation is the representation for archiving purposes; the IV shall be a random or pseudo-random number; when encrypted, the IV must be decrypted using the Electronic Code Book (ECB) mode and the same key used to encrypt the message

Segment: **S2A** **Assurance Level 2**
Usage: Optional
Max Use: 1
Purpose: To allow for multiple assurances at the ST/SE level
Syntax Notes:
1 If C02804 is present, then C02803 is required.
2 If C02806 is present, then C02805 is required.
3 If C02808 is present, then C02807 is required.
4 If C02810 is present, then C02809 is required.
5 If C02812 is present, then C02811 is required.
6 If C02814 is present, then C02813 is required.
7 If C02816 is present, then C02815 is required.
8 If C02818 is present, then C02817 is required.
9 If C02820 is present, then C02819 is required.
Semantic Notes:
Comments:
1 X9 has a required minimum length of four characters for S2A04 (security originator). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
2 X9 has a required minimum length of four characters for S2A05 (security recipient). No mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier.
3 The date/time stamp may determine which of several key values apply, depending on start and expiration dates of different key values that may share the same keyname.
4 Key distribution is performed by other means and thus only onetime keys are allowed in S2A09.
The use of particular codes and corresponding values in S2A09 is dependent on the exigencies of the various crytographic algorithms.
Notes: ***Assurance (Digital Signature) segments (S2A/SVA) are not part of the control envelope structure. When used, insert the S2A/SVA segment pair(s) immediately preceding the SE segment of the transaction set for which assurance is being provided. See Section 10.5.2 of the Federal Implementation Guidelines.***

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes
Must Use	**S2A01**	**1432**	**Business Purpose of Assurance** The stated business purpose for appending the assurance to an existing secured-entity (whether functional group or transaction set); the codes represent the intention of the business or application that has control over the assurance originator ASG Authorization Signature Appropriate to this Document CSG Authorization Co-signature Appropiate to this Document	**M ID 3/3**
Must Use	**S2A02**	**C034**	**Computation Methods** Algorithms used to calculate an assurance	**M**
Must Use	**C03401**	**1574**	**Assurance Algorithm** Code specifying the algorithm used to compute the assurance token DSS Digital Signature Standard RSA RSA	**M ID 3/3**

Must Use	**C03402**	**1575**	**Hashing Algorithm**	**M**	**ID**	**3/3**

Code specifying the algorithm used to compute the assurance digest

MD5	MD5
SHA	Secure hash algorithm

Must Use	**S2A03**	**1434**	**Domain of Computation of Assurance Digest**	**M**	**ID**	**1/2**

The bounds of the text, whether contiguous or not, over which the computation of the Assurance Token is computed using the defined methodology of computation and any relevant Assurance Token parameters; the "body" is either a transaction set (beginning with the ST and including all segments up to the first S4A segment, but excluding any S4S segment) or functional group (beginning with the GS and including all transaction sets up to the first S1A segment, but excluding any S1S segment

"This Assurance" is defined as from the "S" in S1A or S2A up to and including the data element separator preceeding the assurance digest

"Previous Assurance(s)" is defined as including the entire S1A or S2A segment and the entire SVA that follows the included S1A or S2A

A	Body Only
B	Body plus This Assurance Only
C	Body plus All Previous Assurances plus This Assurance
D	Body plus All Previous Assurances Only
E	This Assurance Only
F	All Previous Assurances plus This Assurance

	S2A04	**1435**	**Assurance Originator**	**O**	**AN**	**1/64**

Unique designation (identity) of the cryptographic process that performs the stated assurance on data to be interchanged

Note: X9 has a required minimum length of 4 characters for a security originator; no mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier

	S2A05	**1436**	**Assurance Recipient**	**O**	**AN**	**1/64**

Unique designation (identity) of the cryptographic process that performs validation of the stated assurance on received data. In the absence of an Assurance Recipient all potenial receivers will often be able to validate the assurance because the cryptographic technique is based on a "public" (as opposed to "secret") technology

Note: X9 has required minimum length of 4 characters for a security recipient; no mechanism, or registration method, is provided by X9 or X12 to guarantee uniqueness of the identifier

	S2A06	**1443**	**Assurance Reference Number**	**O**	**AN**	**1/35**

Alphanumeric reference number issued by security assurance originator for the particular assurance in which it occurs; unique when used in combination with security originator data element

	S2A07	**1437**	**Date/Time Reference**	**O**	**AN**	**17/25**

Date/time stamp in format as follows:

YYYYMMDDHHNNSSTTTZZZ+XXXX, where YYYY = 4 digit year

(with leading century), MM = month of year (01..12), DD = day of month (01..31), HH = hour of day in 24-hour format (00..23), NN = minutes of the hour (00-59), SS = second of hour (00..59), TTT = [optional] milli-seconds (000..999), ZZZ = [optional] three character, nominal timezone indicator (including daylight savings time indicator) and XXXXX = 3-5 digit (including leading + or - sign) offset of time to universal time, with three position format indicating hours-offset for whole hours, and five position format indicating hours and minutes offset where this is necessary. For example:

1993061522133OCDT+0930 which represents 15 June 1993, 22:13 (10:13pm), Central Daylight Time (Nominal Value "CDT"), in a timezone that is offset + 9:30 from Universal Time (Australia)

	S2A08	**1438**	**Assurance Text**	**O**	**AN**	**1/64**
			Any text needed to convey the name of a signatory, registration number, certification number, or other assurance-originator defined or mutually-agreed business text related to the specific assurance; this text is not defined for X12 purposes and thus functions technically as "free form text" though it may have structure that is defined by the assurance originator, an industry group, a governmental agency, or bi-laterally between assurance originator and assurance recipient			
	S2A09	**C028**	**Assurance Token Parameters**	**O**		
			Parameters needed to calculate the Assurance Token			
Must Use	**C02801**	**1439**	**Assurance Token Parameter Code**	**M**	**ID**	**2/2**
			A code specifying the type of Assurance Token Parameter			
			CI Certification Authority ID			
			EK Key Value - One-Time Key			
			KN Key Name			
			NT Notarization			
			OD Key-Encrypting-Key for One-Time Key			
			UI User ID			
Must Use	**C02802**	**1442**	**Assurance Token Parameter Value**	**M**	**AN**	**1/64**
			A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required			
N/U	**C02803**	**1439**	**Assurance Token Parameter Code**	**X**	**ID**	**2/2**
			A code specifying the type of Assurance Token Parameter			
N/U	**C02804**	**1442**	**Assurance Token Parameter Value**	**O**	**AN**	**1/64**
			A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required			
N/U	**C02805**	**1439**	**Assurance Token Parameter Code**	**X**	**ID**	**2/2**
			A code specifying the type of Assurance Token Parameter			
N/U	**C02806**	**1442**	**Assurance Token Parameter Value**	**O**	**AN**	**1/64**
			A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required			

N/U	**C02807**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02808**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02809**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02810**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02811**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02812**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02813**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02814**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02815**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02816**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02817**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02818**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
N/U	**C02819**	**1439**	**Assurance Token Parameter Code** A code specifying the type of Assurance Token Parameter	**X**	**ID**	**2/2**
N/U	**C02820**	**1442**	**Assurance Token Parameter Value** A value of a parameter, usually specifying one or more options, required for the proper operation of the cryptographic algorithm used to compute the Assurance Token; depending on the algorithm used, one or more values may be required	**O**	**AN**	**1/64**
	S2A10	**1440**	**Assurance Digest** The result of the application of the hash defined in the methodology	**O**	**AN**	**1/512**

expressed in ASCII-hex notation

Segment: **SVA** **Security Value**
Usage: Optional
Max Use: 1
Purpose: To provide the encoded output of a cryptographic algorithm
Syntax Notes:
Semantic Notes:
Comments:
Notes: ***Assurance (Digital Signature) segments (S2A/SVA) are not part of the control envelope structure. When used, insert the S2A/SVA segment pair(s) immediately preceding the SE segment of the transaction set for which assurance is being provided. See Section 10.5.3 of the Federal Implementation Guidelines.***

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**SVA01**	**1570**	**Filter ID Code** Code specifying the type of filter used to convert data code values ASB ASCII-Baudot Filter ASC ASCII Filter HDC Hexadecimal Filter R64 Radix 64 UUE Uuencoding	**M**	**ID**	**3/3**
Must Use	**SVA02**	**799**	**Version Identifier** Revision level of a particular format, program, technique or algorithm	**M**	**AN**	**1/30**
Must Use	**SVA03**	**C033**	**Security Value** Value of the Security Token	**M**		
Must Use	**C03301**	**1572**	**Security Value Qualifier** Type of Security Value ASV Assurance Token CRT Certificate PUB Public Key	**M**	**ID**	**3/3**
Must Use	**C03302**	**1573**	**Encoded Security Value** Encoded representation of the Security Value specified by the Security Value Qualifier	**M**	**AN**	**1/1**

Segment: **S2E** **Security Trailer Level 2**
Usage: Optional
Max Use: 1
Purpose: To end a secured area and to provide the value of cryptographically computed authentication codes
Syntax Notes:
Semantic Notes:
Comments:

Data Element Summary

	Ref. Des.	Data Element	Name	Attributes		
Must Use	**S2E01**	**997**	**Hash or Authentication Code** The message authentication code or hash/digest generated by the authentication process; when the Data Encryption Standard (DES) algorithm is used, the field consists of 4 hexadecimal coded characters (i.e., characters from the set 0..9, A..F), a separator character (space, "-", or other), and 4 hexadecimally coded characters; when non-DES hashes are used, the result of the hash is expressed as hexadecimally coded characters without spaces; when authentication or hash is not used, this field should be filled with a non-blank character other than the set (0..9, A..F) for the minimum length ***Enter the character "Z".***	**M**	**AN**	**1/64**